

final disposal acceptance criteria. In 1987, for example, 840 ash receivers from the 1977 shutdown of the feed plant that were stored in C-746B, a radioactive waste storage facility, were determined to also be hazardous under RCRA. Therefore, this facility became a non-permitted RCRA storage facility until the ash receivers could be overpacked and moved to a permitted RCRA facility. The limited degree of characterization has resulted in storage problems and a need for very large recharacterization efforts at the Plant, as discussed in the Office of Oversight Phase I investigation report.

Oversight for hazardous waste activities also increased from being a subset of landfill reviews to being focused inspections. In the 1970s, OR conducted annual appraisals of the C-746-K landfill and of water and air pollution control facilities at the Plant. These appraisals increased in scope and duration in the 1980s, with a section specifically focused on hazardous waste management practices. In addition, external regulators began inspecting RCRA facilities and operations in the 1980s. Generally, these appraisals and inspections praised the waste management programs. However, problems were identified, including Notices of Violation in 1985 for not performing detailed chemical and physical analysis, and concerns about contingency planning with local authorities and incomplete contingency plans. A Notice of Violation was issued in 1986 for routine disposal of sludge determined to be hazardous in the C-404 facility, which had not been permitted for hazardous waste. Conversely, the Plant also conducted evaluations to determine whether private disposal sites were adequately operated and capable of disposing of Plant waste in accordance with applicable environmental regulations.

## Radioactive Waste Management

Radioactive waste management has been evolving since the 1950s. In April 1953, efforts were initiated to reduce the spread of contamination by using drums designed for disposal in work locations known for generating highly contaminated waste. Operating logs in C-340 from 1958 discuss using a supply of scrap drums from the holding pond for packaging black oxide rather than putting the oxide in dumpsters. Actions to segregate these wastes from the Plant's other waste streams resulted in establishing radioactive disposal sites. Although several small sites were used for special disposal activities, including contaminated aluminum and a modine trap, the Plant had three main radioactive disposal sites:

- C-749 Uranium Burial Ground. Used from 1957 to 1977, this site primarily contained pyrophoric uranium metal in the form of saw dust, shavings, and turnings covered in oil. The total amount of uranium placed in this site is approximately 540,000 pounds.
- C-340 Drum and Contaminated Burial Area. Used from the late 1950s until the mid-1970s, this area received C-340 uranium powder scrap. In the 1950s, 50 to 75 drums were emptied into a pit 10 feet by 20 feet, and 7 feet deep. In the 1970s, two more 7-foot-deep pits were used for disposal of contaminated metals and equipment.
- C-404 Solid Radioactive Waste Disposal Area. This was the primary disposal site for radioactive waste at the Plant. This area was constructed as a holding pond for C-400 liquid waste, but in early 1957, it was converted to a solid waste disposal area. The pond was 380 by 140 feet, with 6-foot-high dikes. By 1977, approximately 6,400,000 pounds of uranium had been drummed and placed in the holding area. Waste streams included incinerator ash, contaminated alumina, highly contaminated roofing waste, and gold recovery sludge. This area continued in use into the mid-1980s. Subsequently, this area was determined to contain sludge that was also hazardous, thus requiring closure under RCRA in 1987.

After the formation of the MTM Department, radioactive waste disposal on site rapidly decreased. In 1978 and 1979, the amount of disposal was 330,690 pounds per year; in the 1980s, the average was 18,000 pounds per year. As a result of not burying radioactive waste on site and restrictions for offsite disposal, the site experienced a large buildup of contaminated waste and scrap, as discussed in the Office of Oversight Phase I investigation report.

## 4.2 Management and Disposal of Scrap and Surplus Materials

Large volumes of scrap metal and surplus materials were generated during construction, maintenance, and facility upgrade activities at PGDP. These materials were either managed as waste for disposal or stored and managed as a commodity for resale. Much of the material was contaminated, and large volumes have been

disposed of on site. Additionally, large volumes of scrap metals remain in outside storage pending resolution of policy issues associated with the resale of contaminated materials.

As part of scrap metal activities at the Plant, generators were responsible for requesting disposal containers for contaminated and clean scrap metal and then inspecting these containers to determine proper usage. The Material Services Department established and maintained approved scrap yards, and the Maintenance Services Department collected and transported the containers. In addition, special responsibilities for classified scraps were defined in a standard practice procedure. This procedure, dated July 24, 1969, identified four scrap yards: C-746F for buried classified material; C-746E for contaminated material; an unclassified burial yard; and C-746C for clean material (defined as less than 1000 alpha c/m/100 cm<sup>2</sup> and less than 0.3 mrad/hr beta-gamma). This 1969 procedure also required supervisors to determine whether contamination was sufficient to warrant recovery at the C-400 decontamination and recovery area. If not, the scrap was sent to one of the four disposal yards. Source areas for scrap metal included the C-340 metals plant, the cascades, the C-410 and C-420 feed plant, the C-720 fabrication and maintenance shops, and the laboratories. Part of the scrap was buried directly (classified material); however, as the disposal areas were filled, non-classified material began to accumulate in above-ground piles that still exist. These yards and disposal locations are now identified as SWMUs for investigation and possible cleanup under the current restoration program.

Some of the metal components, equipment, and vehicles at PGDP had significant inherent value, including a large amount of material that was considered scrap as a result of upgrades or replacement of equipment and process piping. Consequently, management wished to sell to interested parties as much of this material as was possible. Based on Plant health physics records, it was clearly understood as far back as the 1950s that “contaminated” material above certain limits could not be sold or released to the public. Therefore, the handling and disposal of scrap materials was subject to the corporate procedures described above. While contamination limits and specific categories changed over the years, scrap was required to generally be categorized into one of four groups: classified scrap, unclassified clean scrap, unclassified contaminated scrap, and unclassified non-metal trash. Dumpster pans were provided for each of these

categories wherever significant quantities of scrap were generated. Line supervisors were responsible for ensuring that employees segregated all scrap materials appropriately. Once full, these dumpsters were hauled to a designated location. The material categorized as clean unclassified scrap was taken to the C-746C clean scrap yards for placement and preparation for public sale.

Interviews with former and current health physics workers indicated that they believed materials released to the public were surveyed for radioactive contamination. However, the surveys were primarily cursory, consisting largely of periodic inspections and spot-checking of suspect materials in the clean scrap yards based on process knowledge. Vehicle floorboards and seats were also said to be spot-checked before sale to the public, but the process was informal and was not required by procedure. The Health Physics and Hygiene Department was on the distribution for notices of public sales and was aware of their responsibility to survey “suspect” items to be sold. Documentation that proper radiological surveys were performed was not consistently maintained until the late 1980s, when the Health Physics and Hygiene Department began to place more emphasis on maintaining formal records for radiological release of material and equipment from the site.

The likelihood that contaminated items were released to various parties during public sales is highlighted by internal memoranda from the mid-1970s. One memorandum calls attention to the fact that the site was doing a less than adequate job of segregating clean from contaminated scrap and that contaminated scrap was often found in clean scrap locations. In May 1976, a health physics inspection of the C-746C scrap yards identified a number of prohibited contaminated items, most notably a 30-gallon drum of uranium metal shavings. A Scrap Handling Committee was formed in mid-1976 to study PGDP solid waste disposal problems, including the issue of segregating contaminated scrap. Some modifications to scrap handling procedures were made; however, a 1977 memorandum indicated continuing problems in this area, particularly with proper implementation of the procedures. Radiological surveys of several older DOE vehicles still present at the site were conducted during this Office of Oversight investigation. These surveys revealed contamination in areas not likely to be detected in cursory surveys of floorboards and seats, such as in the tailgate of a station wagon and in the motor housing and forks of a forklift.